

Lec 2: software architecture and design

→ this phase concerned with determining the appropriate software architecture then performing SW design.

Advantages of well designed system:

- a) Easy to implement.
- b) understandable.
- c) Allows smooth evolution.
- d) Easy to maintain and test
- e) Reliable.

Badly designed systems

- a) may work at first.
- b) Hard to maintain
- c) Difficult to test
- d) unreliable.

→ To facilitate design, we first make a top level decomposition called "SW architecture". Then we make the detailed design.



* High level or architectural design

↳ overall modules structure and relationships among modules (or components)

* Detailed design

↳ define each module in detail and describe its algorithm and data structures.

1) SW Architecture

- It is top level decomposition of system into major components and their inter-relationship.
- It presents an abstract view of sub-systems making up a system.
- often graphical representations (block diagram) called global design.

Purpose of SW Architecture

- 1) Communication with customers and users.
- 2) Help designer to make design decision before making detailed design.
- 3) It can be used to produce SW systems using same architecture, Production line of SW

* Factors that may affect the choice of SW Architecture

- 1) organization constraints.
- 2) background and expertise of the architecture.
- 3) ~~some~~ technical effects of the HW on the functions of the system.

Advantages of SW Architecture

- In general services, which are mutual between more than one basic services ~~are~~
- general services are not repeated for each service
- instead, only one copy is provided and all the basic services call it directly.

1) This minimize size of Code.

2) minimize time and cost taken to produce SW.

3) minimize complexity of SW.

SW Sub Phase 2: Design

- * design process is concerned with decomposing the system into modules every module has lower complexity than system as whole.
- whole modules together satisfy the user requirement.
- * quality of design reflects quality of resulting SW.
- * Errors in design show during running time of SW, and require high cost to repair them.
- * module is identifiable unit in design which has a specific task, inputs and outputs

SW design steps

- 1) system is decomposed to less complex modules.
- 2) for lower levels, we draw graphical representation of the algorithm to be performed.
- 3) for each higher and lower modules, we have to specify the function it performs.

4) Determine the test cases to be used in test phase.

5) write design ~~document~~ ^{document} to include all previous steps.

→ most famously levels of design:-

1) Function design.

2) database design.

3) screen (interface design)

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